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ABSTRACT

Information is presented on the role of research in the undergraduate psychology curriculum. The kind of research experiences undergraduates are provided and the importance of research experience to graduate school admission has been studied. Ninety-two percent of 60 randomly selected schools of five different types require an introductory experimental course (in addition to statistics), while 63 percent require some sort of advanced research course or project. A survey of the American Psychological Association revealed that the number of students enrolled where undergraduate research is highly valued as an admission criterion constitute about 50 percent of masters-only-program students, and 71 percent of doctoral-program students, with child/developmental and industrial programs valuing undergraduate research the most. An apprenticeship system is described wherein junior/senior majors work with professors in the procedure planning, the data collection and analysis, and conclusion drawing stages of research, which culminates when students present papers at professional conferences. (Author/SW)

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The Role of Research in Undergraduate Psychology Education

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Running Head: Research in Undergraduate Psychology

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Abstract

Accepting the presupposition that research design and inferential statistical methods are the unifying bond of psychology, several questions are asked: 1) What kind of research experiences are undergraduates getting? Ninety-two percent of 60 randomly selected schools of five different types require an introductory experimental course (in addition to statistics), while 63% require some sort of advanced research course or project. 2) How important is research experience for gaining admission to graduate programs? A survey of the APA's 1979-1980 Graduate Study in Psychology revealed that the number of students enrolled where undergraduate research is "highly valued" as an admission criterion constitute about 50% of Masters-only-program students, and 71% of Ph.D.-program students, with child/developmental and industrial programs valuing undergraduate research the most. 3) What should be the nature of the undergraduate original research experience? An apprenticeship system is described wherein junior/senior majors work with professors in the procedure planning, the data collecting, reducing and analyzing, and conclusion drawing stages of research, stressing absolute integrity, and culminating in the students presenting papers at professional conferences.

The Role of Research in Undergraduate Psychology Education

Most of us would probably subscribe to the position that research, cleverly conceived, carefully conducted, and clearly concluded, is at once the viscera and genitalia of psychology, for without it our body professional could neither live nor propagate. (Some might argue for a brain in there somewhere . . . but never mind . . .) We would argue that since there is no overall, unifying theory in psychology, what binds us together, to the extent that we are bound together, is our belief that we must, like Bacon's bold neophyte, actually look into the mouth of the horse and count the teeth. What binds us together more than anything is our commitment to procedures of measurement, and to the methods of statistics, particularly to variance analysis and probabilistic inference.

But, what of the role of research in the undergraduate education of psychology majors? I dare say many of us have mixed feelings. The mix consists of our own excitement about, and dedication to, an area of research; our fear that many of our students are simply not capable of doing anything much more cognitively complex than counting horses' teeth; and our nagging feelings of guilt that we should be training most of our students in some sort of relevant job skills. Certainly, most undergraduate psychology majors do not go on for the Ph.D. where research is the sine qua non.

You have no doubt noticed that I have not defined the term "research." Let me do so. By psychological research I mean the systematic collection of data to try to discover functional relationships. Notice I did not use the term "experiment"--more about that later. Clearly, in order to do research, to make discoveries, a student must learn certain methods of research design

and statistical analyses. These skills are usually learned in statistics, experimental design, or experimental psychology courses. One question we might ask is, "Are such courses thought to be valuable enough to be made required courses in psychology curricula?" An ancillary question is, "Are more advanced research courses required for the major?" A random sample of 12 institutions from each of five types offering the Bachelor's degree in psychology is shown in Figure 1. The institutions are categorized by the highest

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Insert Figure 1 about here

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degrees they grant in psychology and, for those that grant only the Bachelor's degree, by public vs. private vs. church supported.

Note that the overwhelming majority (92%) of schools of all types require an introductory experimental psychology course. All of these institutions also require a statistics course, usually prerequisite to the experimental course. Overall, 63% of our sample required more than the introductory experimental course. Specifically, 30% of the schools required at least one advanced experimental course, laboratory, independent research project, or senior thesis; with small private liberal arts schools leading the way. The second category, "Upper level research strongly recommended," did not include institutions for whom such research was recommended only for those planning on going on to graduate school. Inclusion of those data would have increased the per cent in this category somewhat. Even granting the tentativeness of data from such relatively small samples, the results nevertheless seem clear. Some basic research skills are being taught at the undergraduate level. It appears that not many departments have opted for a two-track system: one a more

rigorous, research track for the graduate-school-bound student, the other a soft, terminal B.S. track.

Certainly, for those students intending to go on to graduate work, undergraduate research experience is important. All other things, such as good GREs and GPAs, being equal, it is probably the crucial factor in admission to a graduate program. One way to determine how important undergraduate research experience is for gaining admission into graduate programs is simply to look at graduate programs' statements regarding the importance of non-objective criteria for admission as published in the APA's annual Graduate Study in Psychology. Figure 2 shows the number of students in graduate programs where

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Insert Figure 2 about here

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the Master's degree is the highest psychology degree granted as a function of the type of Master's curriculum, and the value placed on undergraduate research as a non-objective admission criterion. The number of students enrolled where undergraduate research experience is highly valued constitutes about 50% of Masters-only-program students. Figure 3 shows the number of Master's and Ph.D.

Insert Figure 3 about here

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students enrolled in various types of programs in Ph.D. granting institutions. (Unfortunately, it was necessary to combine Master's with Ph.D. students because in most cases the numbers are not given separately in the APA publication.) Note not only the much greater value placed upon undergraduate research, but perhaps surprisingly, that child/developmental psychology and industrial psychology show, proportionately, the highest value on previous

research experience. For the Psy.D. and Ed.D. programs (Figure 4) previous

Insert Figure 4 about here

research experience is much less valued, but these programs have relatively few students in them. Figure 5 shows the Psy.D., Ed.D., Ph.D./Master's

Insert Figure 5 about here

program data all combined.

It should be pointed out that there is another non-objective criterion which is rated high in importance by many graduate programs--letters of recommendation. And we all know that we write the best letters of recommendation for those students who have done good research under our supervision.

Finally I wish to address a key question I've been skirting; that is the nature of the research which can be expected, or demanded of undergraduates. There's research . . . , and there's research. Clearly, the canned exercises carried out in many introductory experimental courses are not research in the sense of my definition, for it does not create new knowledge. It may allow students to "discover" old facts, but this is not, after all, terribly exciting. I would, however, argue that a certain amount of canned experimentation is necessary in the diet of sophomores, for it enables them to gain experience in a variety of methodologies and content areas, and with a variety of equipment. I believe one of the most important single learning experiences in all of psychology is hand shaping a rat in a Skinner box, and going through discrimination training, extinction, etc. Several studies have shown such an experience to be very interesting to, and highly valued by, students. I might

also put in a plug for computer simulated experiments such as EXPER-SIM which allow students to learn a great deal about experimental design in a very short time, thus making a good supplement to hands-on, real-world research experiences.

But what about "real research," that which produces new knowledge? This is the stuff which has the greatest potential for either turning students on or wiping them out. This is what takes tremendous amounts of faculty and student time and energy. If all one needs in order to do good research in chemistry is "brains and running water," then in psychology all one needs is brains. Certainly there is no other discipline where so much exciting research can be done with so little equipment -- although granted, certain kinds of research can only be done with sophisticated equipment such as on-line computers or polygraphs. But what do we expect from our students' research? Do we want them to make major research breakthroughs -- to effect paradigm shifts, or merely to learn firsthand the reality of Murphy's law. Do the goals have to be uniform for all subject areas, for all students? I doubt it. It seems to me that real research for undergraduates boils down essentially to two kinds: (1) apprenticeships and (2) independent/student initiated research. It is certainly easier for those of us with active research interests to engage students in our own research as data collectors, reducers, and analyzers than it is to help steer them through a topic whose literature we do not know, although there are several advantages for students who develop their own research plans and carry them out; and my own bias is for a modified apprenticeship in which students attempting their first upper-division "real" research contribute to some of my programmatic "puzzle solving" research within the general cognitive/psycholinguistic paradigm.

Walker and McKeachie (1967) have provided an excellent outline of the steps involved in the research process which it would be useful to consult (See Table 1). When I teach one of ISU's required junior/senior level research

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Insert Table 1 about here

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courses in psycholinquistics I usually bring students in at Step 9, "executing the experiment," after having gone through with them in some detail my reasoning on Steps 1 and 2, and 4 through 8. They sometimes help with Step 8, "plan procedures," often helping generate stimulus material (sentences in most of my studies). The students then do Steps 10-12 (through "analyzing the data"), and, as time permits, Step 13, "drawing suitable conclusions," and 14, "writing a report of the experiment." The more able and harder working students I usually help write up the paper for presentation at professional meetings. This provides a nice capstone experience for these students. It looks good on the Vita to have read a paper at MPA, or even a state psychological association meeting or student paper session. Psi Chi paper sessions provide another such forum, as does the Bowling Green Conference, etc. Our Indiana State University Sigma Xi Club sponsors a spring student paper conference, something some of you might wish to initiate in your local Sigma Xi Clubs or Chapters. And of course, there is the ultimate goal to be achieved--to shape the paper to the point where it is accepted, or at least presentable to, a good journal.

Another goal I work hard to achieve is to instill a sense of the tremendous importance of absolute integrity in following the procedures exactly, of recording with great care without regard to the hypothesized direction of the results, and in maintaining this same integrity in data reduction and analysis.

I have found Theodore Barber's little book Pitfalls in Human Research: Ten Pivotal Points (1976) to be a valuable aid in achieving these aims.

In closing, let me say a word about types of research and research methodologies. While I am personally an experimentalist snob, and believe that no research compares to that using the experiment method--of randomly assigning subjects to treatment conditions, etc., -- I think we should expand our research horizons and provide both a) formal course work getting into quazi-experimental, correlational, covariance. and multivariate designs, and b) some research experiences in these areas. A Bachelor's level student with these skills should find many employment opportunities in everything from business and marketing research to educational and evaluation research. These tools will also be valuable for those students going on to graduate schools.

And in all the student's research experiences let us hope that he or she will catch that kernel of Hericlitian truth, that the only thing stable about the facts of psychology are their constant state of change; and that to be able to discover and interpret new facts, or at least to be able to understand what others are discovering, is absolutely essential. Hopefully the undergraduate research experience will, if nothing else, accomplish this goal.

References

Barber, T. X. Pitfalls in human research: Ten pivotal points. Elmsford, N.Y.: Pergamon, 1976.

Graduate study in psychology: 1979-80. Washington, D.C.: American Psychological Association, 1979.

Walker, E. T., & McKeachie, W. J. Some thoughts about teaching the beginning course in psychology. Belmont, California: Brooks/Cole, 1967.

Table 1

Steps Involved in Doing Research (from Walker & McKeachie)

1. Achieves a sufficient acquaintance with an area to permit the perception of a gap in knowledge, a problem, or an insufficiency of information.
2. Formulates a general problem statement.
3. Develop a variety of forms of the problem statement.
4. Selects one form which seems suitable from the standpoint of feasiability for research purposes.
5. Refines the problem statement to the form of an hypothesis.
6. Explores a range of coordinations to the empirical level.
7. Selects variables which are feasible in terms of:
   a. time
   b. money
   c. equipment
   d. space
   e. availability of suitable subjects
   f. the ethical values of our society
8. Plans procedures.
9. Executes the experiment.
10. Assembles and organizes the data.
11. Analyses the data.
12. Tests for statistical significance, if necessary.
13. Draws suitable conclusions.
14. Writes a report of the experiment.
15. Revises the paper to conform to some set of external standards or criticisms of a reviewer.

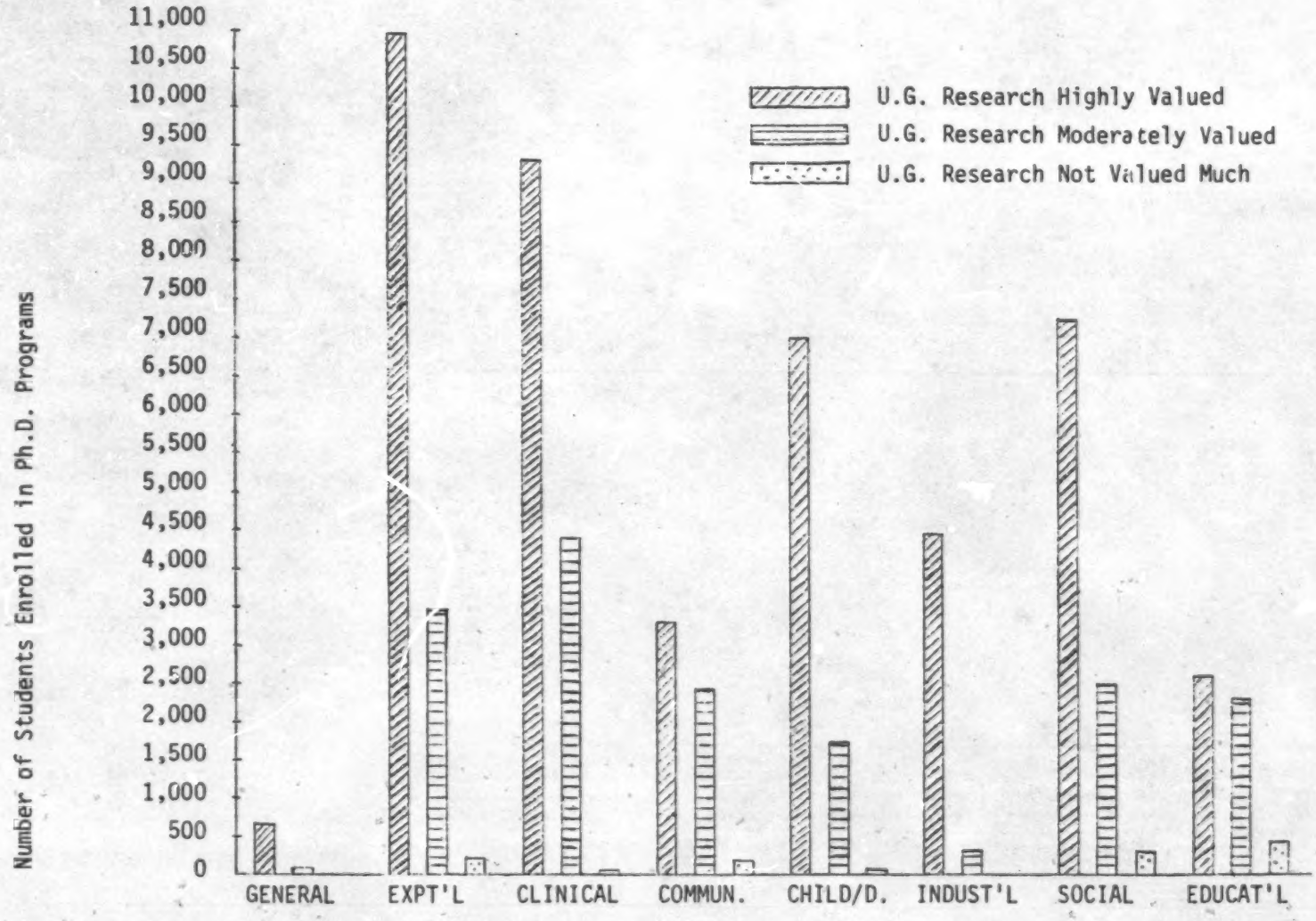

FIG. 3 Number of Students in Types of MA, MS/Ph.D. Programs Showing Value Placed on U.G. Research

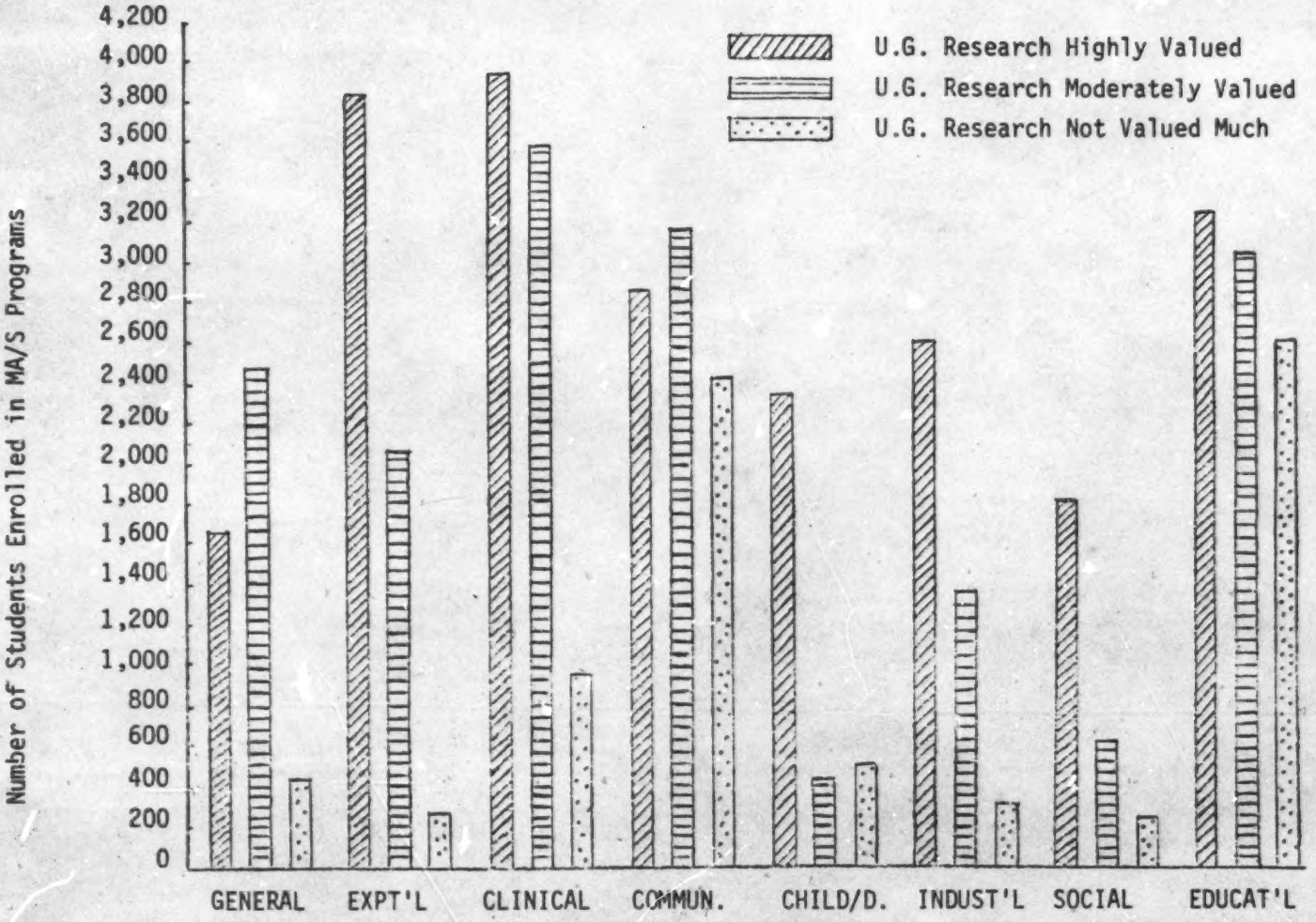

FIG. 2 Number of Students in Types of MA/MS only Programs Showing Value Placed on U.G. Research

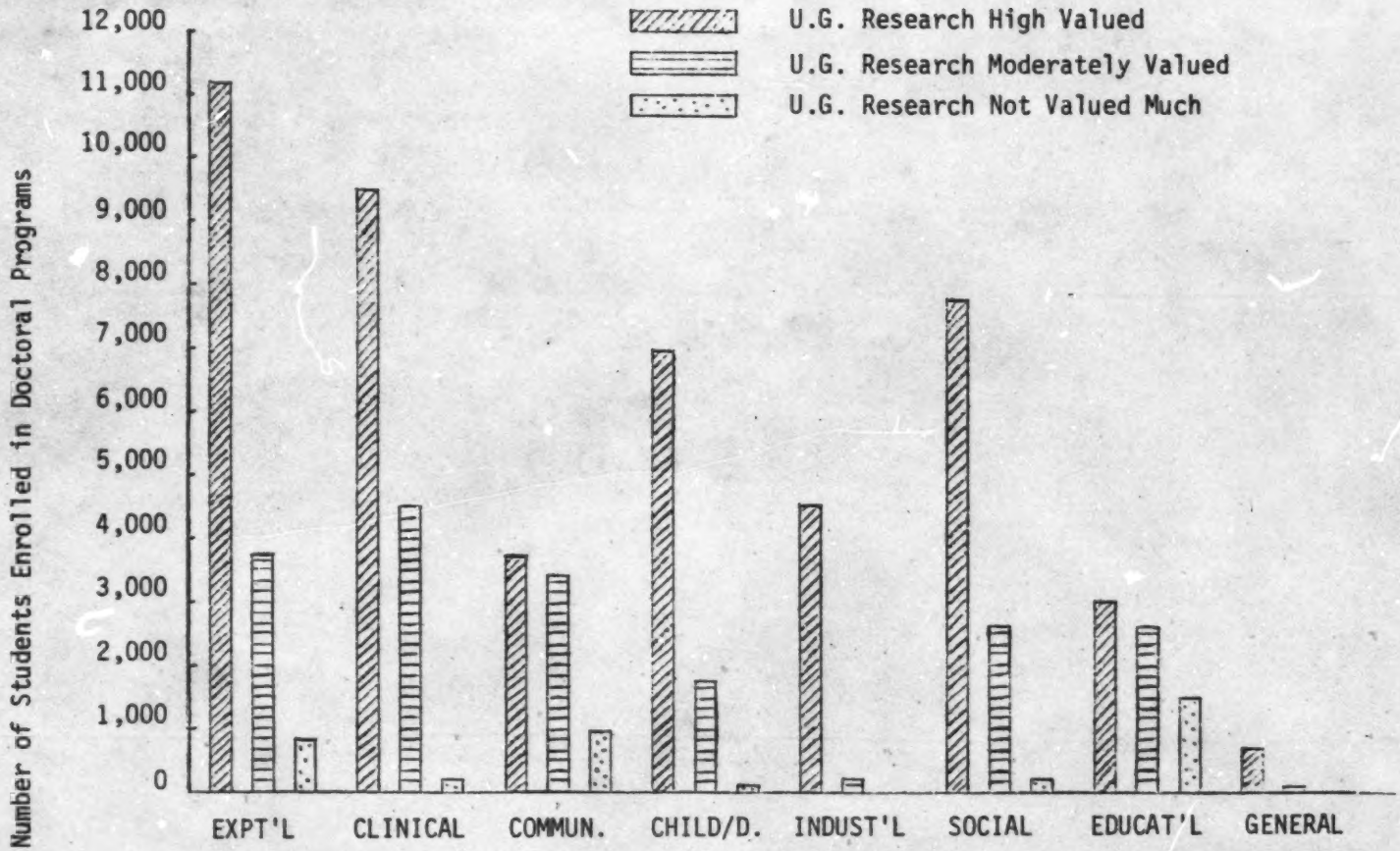

FIG. 5 Number of Students in Types of Masters/Doctoral Programs Showing Value Placed on U.G. Research

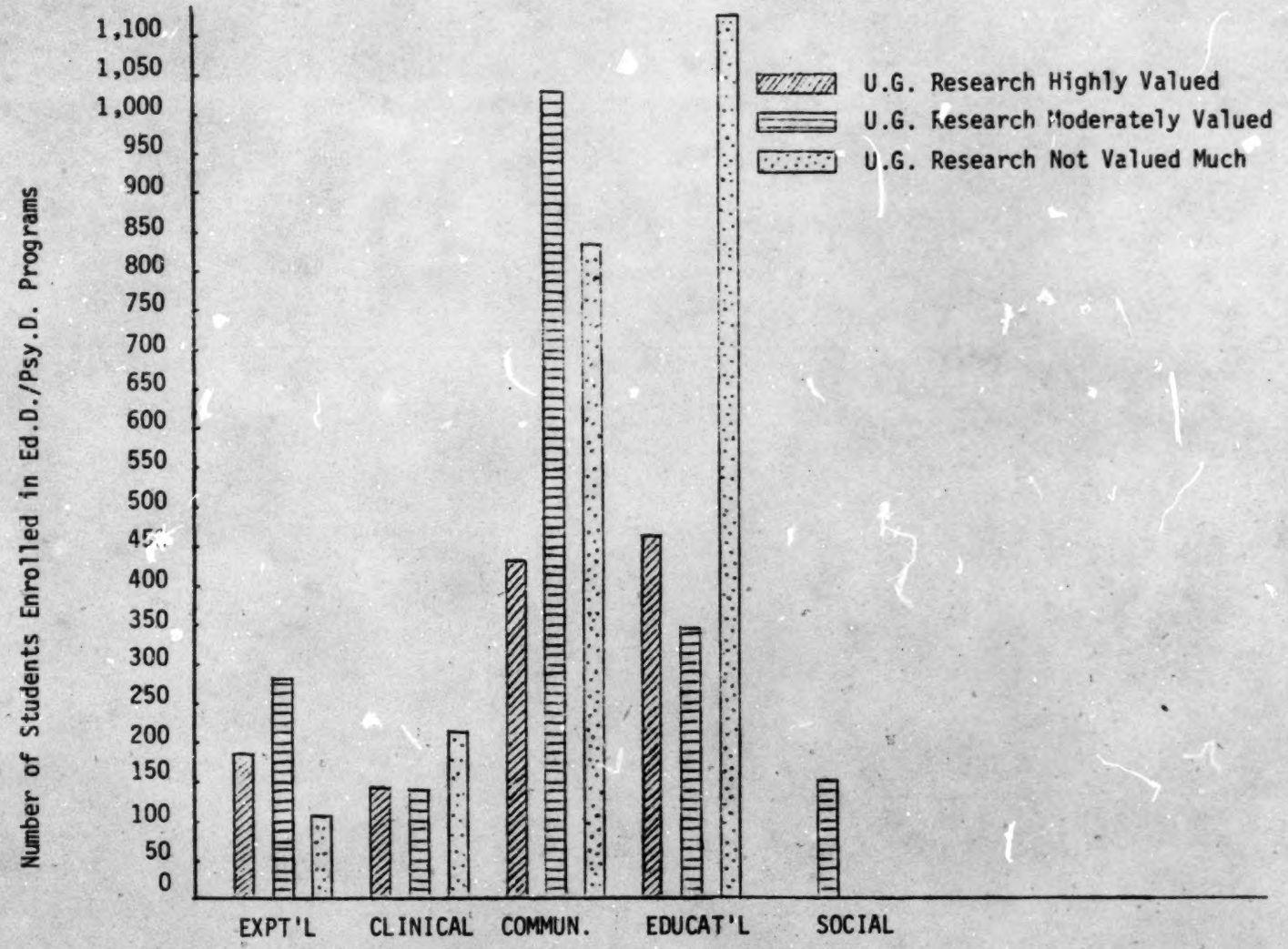

FIG. 4 Number of Students in Types of Ed.D./Psy.D. Programs Showing Value Placed on U.G. Research

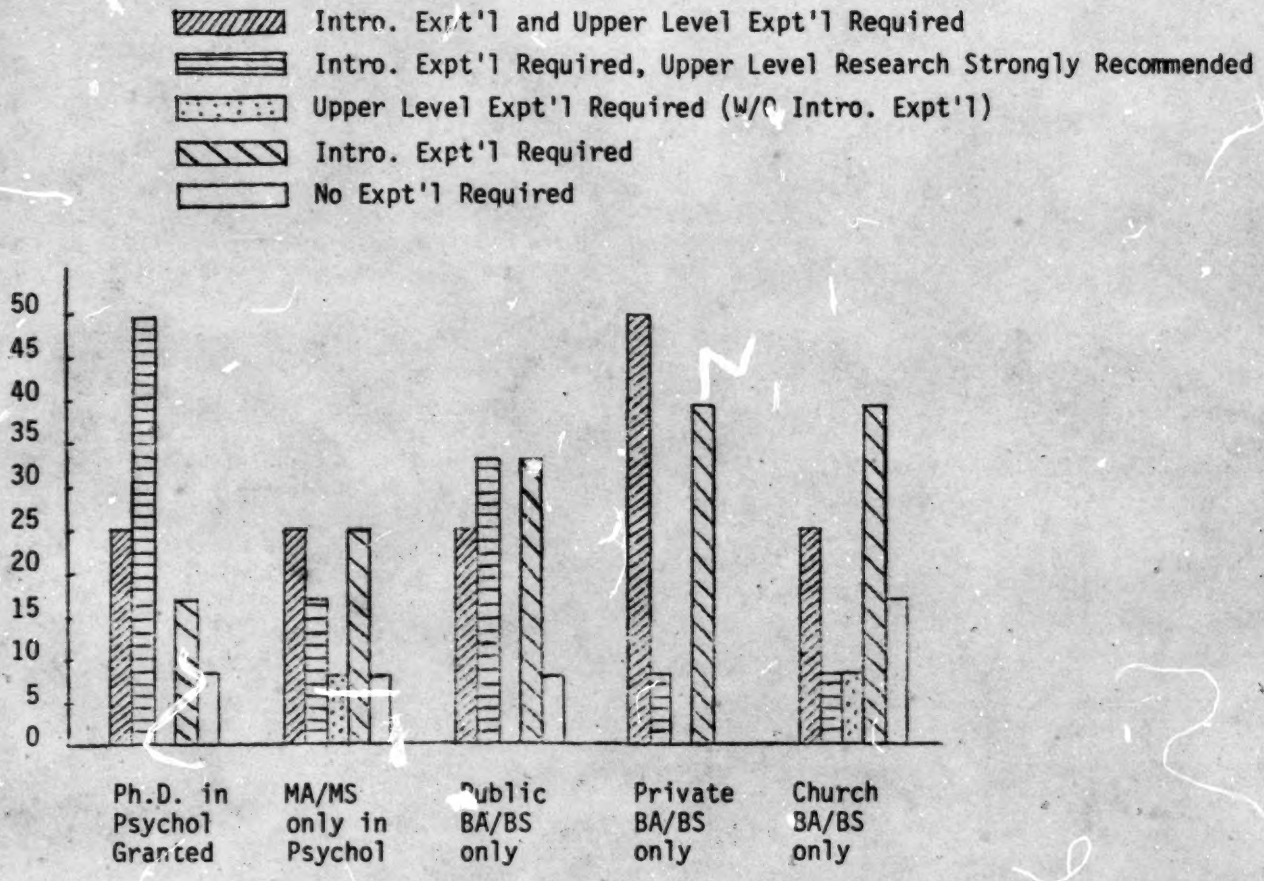

FIG. 1 Undergraduate Expt'l/Research Courses Required in Different College Types